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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,827	01/15/2004	Scott Fuller	AM-5852.D1	7133
7590	08/31/2004		EXAMINER BARRECA, NICOLE M	
Patent Counsel Applied Materials, Inc. P.O. Box 450 A Santa Clara, CA 95052			ART UNIT 1756	PAPER NUMBER

DATE MAILED: 08/31/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/758,827		FULLER ET AL.	
	Examiner		Art Unit	
	Nicole M Barreca		1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2/18/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 16-35 are pending in this application.

Claim Objections

2. Claims 24 and 32 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims recite a difference in CD less than about 25 nm, which does not further limit claim 20 which claims a CD difference less than 20 nm.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 16-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims as written have numerous examples of numerical range end points that were not supported by the original specification, figures or claims. The end points for claimed ranges must be explicitly taught by the applicant's specification, figure or claims. Applicants are not permitted to pick any arbitrary point in a disclosed range and then claim it as an end point, unless

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there is a teaching to that specific point. For example the statement "ranging from about 105 °C to 115 °C, and preferably is about 108 °C", as recited in [0071] would be acceptable support for end points of 105 °C, 108 °C or 115 °C. Specific points given in examples or on a graph, such as PAB temperatures recited in p.22, lines 6-8 and p.23, lines 1-2, or the days illustrated by the points in Fig.4, such as 1, 10, 30, 45, etc., would also be acceptable. See MPEP 2163.06, III, Range Limitations. Also please note Fig.6 as discussed by the applicant as providing support for the claims discloses post-**exposure** baking (PEB) temperatures, while the claims recites a post-application process (PAB). Specifically the examiner has not found support for the following:

PAB at an end point of 80 °C (cl.16, 20)

PAB at an end point of 100 °C (cl.23, 31)

Storage of the substrate for more than 2 hours (cl.16, 20)

Storage at an end point of 2 hours (cl.24, 32)

Storage at an end point of 130 days or 360 days (cl.26, 27, 34, 35)

PAB time of greater than one minute (cl.21, 29)

PAB greater than 7 or 9 minutes (cl.18, 22, 30)

The examiner has only found examples or teachings of a PAB time of 7 or 9 minutes and nothing which would teach the entire range greater than these times.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 contains the trademark/trade name AZ-Clariant DX 1100. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe the photoresist and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 16-18, 20-21, 23-24, 28-29, 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Montgomery (6605394)

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The applied reference has a common inventors and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

9. Chemically amplified DUV photoresist DX 1100 is applied on a mask substrate. A post-application bake is critical for obtaining acceptable CD uniformity performance. The PAB was performed for 7 minutes at 105 °C. There is a less than 5 nm change in CD over a 6 hour time period. See example 1 in col.11-13.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 16, 18-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan (6200736) in view of Capodieci (US 5717612).

12. Tan discloses a patterning method. A diazonaphthaquionone (onium) -sensitized novolak (phenolic) photoresist is coated on a quartz glass photomask substrate and soft-baked (post-application baked). The soft baked process is carried out at 90-95 °C for 30-60 minutes (col.8, 47-col.9, 9 and ex.1). The fabricated photomask has a

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resolution of 0.20 microns and a dark loss less than 10% (abstract). Tan does not disclose that the soft baking ensures that the coated substrate may be stored a specific period of time, such as more than 2 hours, 2 hr-10 days, 10-45 days, 45-130 days or 130-360 days. Capodieci teaches that pre-baking will make a photoresist coated substrate solid and stable. It would have been obvious to one of ordinary skill in the art that the post-application baking in the method of Tan made the photoresist coating on the substrate stable for storage for any period of time because Capodieci teaches that it is known that pre-baking will make the photoresist stable.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M Barreca whose telephone number is 571-272-1379. The examiner can normally be reached on Monday-Thursday (9AM-7PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Nicole M Barreca
Examiner
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8/26/04

A handwritten signature in cursive script, appearing to read "Nicole M Barreca".